

Do Canola Cultivars Differ in S Fertilizer Requirements for Optimum Yield, Seed Quality and S Uptake?

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Canola has high requirements for S and canola cultivars differ in growth rate, yield potential, rooting system and genetics. This may result in diverse response of canola cultivars to S deficiency in soil and S fertilization, as well as have potential to use canola cultivars with high S use efficiency to optimize yield and seed quality benefits. A three site-years field study was conducted on S-deficient soils in northeastern Saskatchewan, Canada, to determine differences in response of four canola cultivars to S deficiency and S fertilization in terms of yield (seed and straw), seed quality (oil, protein and S concentrations), and S uptake (seed and straw). Two *Brassica napus* L. (Quantum and AC Excel) and two *B. rapa* L. (Maverick and AC Parkland) cultivars were compared at 0, 5, 10, and 15 kg S ha⁻¹ rates. For yield of seed and straw and S uptake of seed, both the actual values and responses to S fertilization were relatively greater for *B. napus* compared to the two *B. rapa*. Thus, the differences between *B. napus* and *B. rapa* cultivars tended to increase with increasing S rate. But the response of seed quality measurements and S uptake in straw to S fertilization was not influenced by the cultivars, although there were differences between actual values for the cultivars. For all four cultivars, however, generally yield responded up to the 10 kg S ha⁻¹ rate, and seed quality and S uptake measurements responded up to 15 kg S ha⁻¹ rate at these site-years. Response to S fertilization was generally of quadratic nature for seed and straw yield, oil and protein concentration in seed, and S uptake in seed. The yield, seed quality and S uptake data did not indicate any need for different S fertilization rate for each canola cultivar. In summary, the results suggest that increase in seed yield from S fertilization varies among canola cultivars, but similar fertilizer S rate for different cultivars.